

Claims

[c1]

A water/air contact medium for use in an evaporative cooler, comprising a fibrous material impregnated with a compound having a continuous phase for inhibiting deposition of one or more dissolved or particulate contaminants in the water onto the medium, the continuous phase further comprising a polymer or combination of polymers, the continuous phase having a nonpolar solubility parameter δ_n within the range of about 6.5 to about 8.5 g, a polar solubility parameter δ_p within the range of zero to about 8.5 g, and a hydrogen bond solubility parameter δ_h within the range of zero to about 7.0 g

[c2]

A contact medium as recited in claim 1, wherein the continuous phase also has a surface tension between about 20 and 70 dynes/cm and an interfacial tension with in-service water between zero and about 30 dynes/cm.

[c3]

A contact medium as recited in claim 2, wherein the continuous phase has an overall cationic charge.

[c4]

A contact medium as recited in claim 1, wherein the continuous phase has a nonpolar solubility parameter δ_n within the range of about 6.5 to about 8.5 g-cal/mole, a polar solubility parameter δ_p within the range of about 2.5 to about 7.5 g-cal/mole, and a hydrogen bond solubility parameter δ_h within the range of about 0.7 to about 5.0 g-cal/mole.

[c5]

A contact medium as recited in claim 1, wherein the continuous phase has a nonpolar solubility parameter δ_n within the range of about 6.5 to about 8.5 g-cal/mole, a polar solubility parameter δ_p within the range of about 3.0 to about 5.5 g-cal/mole, and a hydrogen bond solubility parameter δ_h within the range of about 1.0 to about 4.0 g-cal/mole.

[c6]

A contact medium as recited in claim 1, wherein the continuous phase has a surface tension between about 30 and about 68 dynes/cm, and an interfacial tension with in-service water between zero and about 23 dynes/cm.

[c7]

A contact medium as recited in claim 4, wherein the continuous phase has a surface tension between about 30 and about 68 dynes/cm, and an interfacial tension with in-service water between zero and about 23 dynes/cm.

[c8]

A contact medium as recited in claim 5, wherein the continuous phase has a surface tension between about 30 and about 68 dynes/cm, and an interfacial tension with in-service water between zero and about 23 dynes/cm.

[c9]

A contact medium as recited in claim 1, wherein the continuous phase has a surface tension between about 40 and about 68 dynes/cm, and an interfacial tension with in-service water between zero and about 15 dynes/cm.

[c10]

A contact medium as recited in claim 4, wherein the continuous phase has a surface tension between about 40 and about 68 dynes/cm, and an interfacial tension with in-service water between zero and about 15 dynes/cm.

[c11]

A contact medium as recited in claim 5, wherein the continuous phase has a surface tension between about 40 and about 68 dynes/cm, and an interfacial tension with in-service water between zero and about 15 dynes/cm.

[c12]

A contact medium as recited in claim 1, further comprising a discontinuous phase dispersed in the continuous phase.

[c13]

A contact medium as recited in claim 12, wherein the discontinuous phase further comprises fillers, pigments or extenders or combinations thereof.

[c14]

A contact medium as recited in claim 13, wherein the continuous phase and the discontinuous phase together make up between three and about sixty percent of the total weight of the contact media when dry.

[c15]

A contact medium as recited in claim 13, wherein the continuous phase and the discontinuous phase together make up between five and about twenty-five percent of the total weight of the contact media when dry.

[c16]

A contact medium as recited in claim 13, wherein the continuous phase and the discontinuous phase together make up between about ten and about fifteen percent of the total weight of the contact media when dry.

[c17]

A water/air contact medium for use in an evaporative cooler, comprising a fibrous material impregnated with a compound having a continuous phase for inhibiting deposition of one or more dissolved or particulate contaminants in the water onto the medium, the continuous phase further comprising a polymer or combination of polymers, wherein the continuous phase has the following properties: a) a nonpolar solubility parameter δ_n within the range of about 6.5 to about 8.5 g-cal/mole; b) a polar solubility parameter δ_p within the range of zero to about 8.5 g-cal/mole; c) a hydrogen bond solubility parameter δ_h within the range of zero to about 7.0 g-cal/mole; d) a surface tension ranging between about 20 and 70 dynes/cm; and e) an interfacial tension with in-service water ranging between zero and about 30 dynes/cm.

[c18]

A contact medium as recited in claim 17, wherein the plastic polymer has an overall cationic charge.

[c19]

A contact medium as recited in claim 17, wherein the continuous phase has a nonpolar solubility parameter δ_n within the range of about 6.5 to about 8.5 g-cal/mole, a polar solubility parameter δ_p within the range of about 2.5 to about 7.5 g-cal/mole, and a hydrogen bond solubility parameter δ_h within the range of about 0.7 to about 5.0 g-cal/mole.

[c20]

A contact medium as recited in claim 17, wherein the continuous phase has a nonpolar solubility parameter δ_n within the range of about 6.5 to about 8.5 g-cal/mole, a polar solubility parameter δ_p within the range of about 3.0 to about 5.5 g-cal/mole, and a hydrogen bond solubility parameter δ_h within the range of about 1.0 to about 4.0 g-cal/mole.

[c21]

A contact medium as recited in claim 17, wherein the continuous phase has a surface tension between about 30 and about 68 dynes/cm, and an interfacial tension with in-service water between zero and about 23 dynes/cm.

[c22]

A contact medium as recited in claim 17, wherein the continuous phase has a surface tension between about 40 and about 68 dynes/cm, and an interfacial tension with in-service water between zero and about 15 dynes/cm.

[c23]

A contact medium as recited in claim 17, further comprising a discontinuous phase dispersed in the continuous phase.

[c24]

A contact medium as recited in claim 23, wherein the discontinuous phase further comprises fillers, pigments or extenders or combinations thereof.

[c25]

A water/air contact medium for use in an evaporative cooler, comprising: a) a fibrous material; b) an intermediate layer comprising a polymer or unsuitable material deposited on the fibrous material; and c) an impregnating compound deposited on and covering the intermediate layer; the impregnating compound having a continuous phase for inhibiting deposition of one or more dissolved or particulate contaminants in the water onto the medium, the continuous phase further comprising a polymer or combination of polymers, wherein the continuous phase has the following properties: i) a nonpolar solubility parameter δ_n within the range of about 6.5 to about 8.8 g-cal/mole; ii) a polar solubility parameter δ_p within the range of zero to about 8.5 g-cal/mole; iii) a hydrogen bond solubility parameter δ_h within the range of zero to about 7.0 g-cal/mole.; iv) a surface tension ranging between about 20 and 70 dynes/cm; and v) an interfacial tension with in-service water ranging between zero and about 30 dynes/cm.

[c26]

A contact medium as recited in claim 1, wherein the polymer or combination of polymers of the continuous phase is selected from the group consisting of epoxies, polyacetals, polyacrylates, polyacrylics, polyacrylamides, polyalkylamides, polyamides, polyamideimides, polycarbonates, polycarboxylicdihydric esters, polyimides, polyesters, polycellulose acetate butyrates, polydiglycidyletheralkyl/aryldiols, polysilicones, polysiloxanes, polysiloxides, polystyrenes, polysucrose acetate butyrates, polysulfonamides, polysulfones, polyurethanes, polyvinylacetals, and polyvinylhalogens.

[c27]